

Rice Sheath Blight Disease and Its Integrated Management

Raghu S, Jeevan B, Rupak Jena, Gaurav Kumar, Srikanta Lenka, Totan Adak and SD Mohapatra

I. About the Disease

Hindi Name: आवरण झुलसा रोग; शीथ ब्लाइट रोग

Odia Name: ପତ୍ରାଢ଼ାକ ପୋଡ଼ାବୋଗ (Patracchad Podaroga)

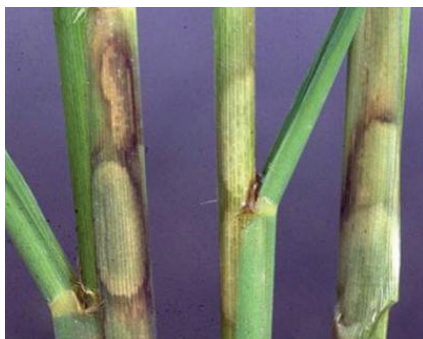
Sheath blight is a most destructive fungal disease of rice after Blast. The disease is widely distributed in all the rice growing areas of the world. In Odisha, the disease is a major problem in all the agro-climatic zones. The disease was first reported from Japan in 1910 and subsequently from all the rice growing regions. The disease is a major problem in Africa, Asia, North and South American Countries. The disease was first reported in India from Gurdaspur area of Punjab in 1963, later continuously reported from all the parts of India. The disease can cause a yield loss up to 50% under epidemic conditions. The disease can infect from tillering to maturity stage.

II. Disease symptoms

- The initial infection occurs on the stem near the water line and appears as a water soaked oval lesion which often dries and turns tan.
- The lesions soon enlarge, with irregular dark brown margins with centre bleached to grayish white.
- Appearance of many of such lesions on leaf sheath or stem gives a snake skin appearance.
- The infection spreads rapidly to upper leaf sheaths and leaf blades of the same or adjacent tillers from the water level to flag leaf height.
- Lesions vary in appearance due to wetness, age, host resistance, and fungicide use.
- Lesions tend to be darker on resistant plants after fungicide use.
- Leaf lesions usually develop the characteristic snake skin like pattern
- This ultimately causes death of whole leaf, tiller and entire plant in most of the times.
- Advanced stage of infection can be noticed by the formation of sclerotial bodies on the plant surface that later turn dark brown to black.
- Infested plants are usually found in a circular pattern, locally referred to as “bird’s nest” or “snake skin” spot.
- Infected plant bears fewer tillers and very few filled grains.



Typical snake skin symptoms on leaf sheath



Enlarged spots on leaf sheath



Initial symptoms on stem near waterline



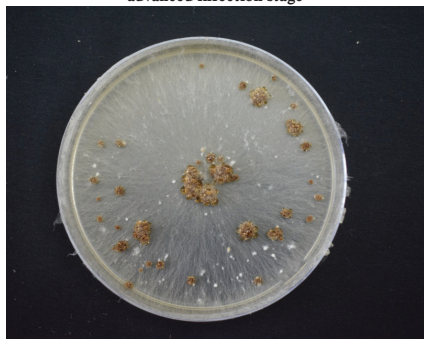
Symptoms on leaves



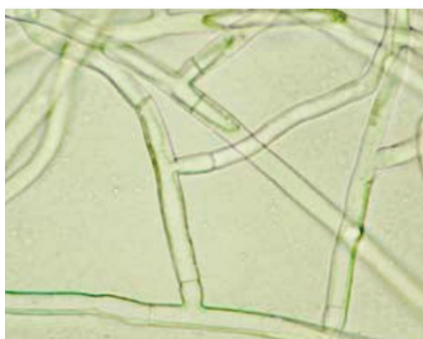
Development of mycelium and sclerotia on stem at advanced infection stage



Severely infected stem



Rhizoctonia solani culture on PDA



Right angle branching of mycelium

III. Pathogen

- The disease is caused by *Rhizoctonia solani* (AG-1) (Sexual stage: *Thanetophorus cucumeris*).
- The fungus produces septate mycelium which are hyaline when young, yellowish brown when old.
- It produces large number of spherical brown sclerotia on advanced infection stage.
- Sclerotia produced by the fungus and to a lesser extent the fungal mycelium surviving in the plant debris serve as a major source of primary infection, particularly in humid tropics.
- Sclerotia can also survive for a long period in the temperate rice production areas.

IV. Economic thresh hold level (ETL)

Lesions of 5-6 mm in length & 2-3 infected plants/m²

V. Critical Stages of Infection

Early to late tillering, booting and grain maturity stage

VI. Favorable conditions for disease incidence

- High relative humidity of more than 96-97%.
- Warm temperature (28-32 °C).
- Close Planting
- Heavy application of nitrogenous fertilizers.
- Frequent showers
- Presence of pathogen propagules in the soil
- Sheath blight severity increases when there is presence of BPH and rice root nematode *Hirschmaniella oryzae*.
- Weed plants viz. *Pennisetum americanum*, *Solanum tuberosum*, *Cynodon dactylon*, *Digitaria adscendus*, *Echinochloa crusgalli* and *Cyperus*, *E. colona*, *Euphorbia microphylla*, *Leptochloa chinensis*, *Dactyloctenium aegypticum*, *Dicanthium annulatum* and *Paspalum*, *Digitaria ciliaris*, *Euphorbia hirta*, *Paspalum scrobiculatum* and *Commelina benghalensis* also acts as collateral hosts.

VII. Management Practices

1. Follow summer phloughing and destruction of crop debris, collateral weed hosts.
2. Follow green manuring with Dhaincha and incorporate in soil before cropping.
3. use resistant/tolerant varieties
 - A. Upland: Phalguni
 - B. Irrigated low land: Chandrama, Satabdi

C. Rainfed shallo lowland: Reeta, Ketakijoha, CR-1014, CR-1002

D. Waterlogged medium land: Hanseswari

4. Optimum Plant spacing should be followed (Avoid closer planting).
5. Application of nitrogen in split doses.
6. Follow seed treatment with Fungicided like Carbendazim 50% WP @ 2g/kg of seeds or Biocontrol agents like *Pseudomonas fluorescence* 10g/kg of seeds or *Trichoderma viridae* @5-10 g/kg of seeds gives protection.
7. Application of Chemical fungicides if the severity crosses ETL.

VIII. List of chemical fungicides approved for management of paddy blast.

Fungicides	Commercial formulations available in market	Dosage/ha			Waiting period from last application to harvest (Days)
		a.i (g)	Formulations (g/ml) %	Dilution in Water (L)	
Validamycine 3L	Valdex, Validacin, Sheathmar, Exylon	60g	2000g	500	30
Carbendazim 50% WP	Bavistin, Benfil, Dazim, Goldstin, Savistin, Carwell, Carzimchem, Avistin, Commando, Carry, Conika	1g/kg of seeds	500	500	
Hexaconazole 5% EC	Contaf, Contaf Plus, Green Taf, Confort Plus, Hexarin Plus, Hexon, Sitara Plus, hexadhan Plus,	50g	1000mL	500	40
Difenoconazole 25% EC	Planova, Score, Karara, Concor, Dimension, and Casper, Difen, D-Zole	12.50	50mL	500	25
Flusilazole 40% EC	Cursor,	120	300	500	24
Hexaconazole 0.5% GR	Zaafu	50	10	500	38
Iprodione 50% WP	Rovral, Chipco 26019, and Verisan	1.125	2.50	750	35
Iprobenfos 48% EC	Kitazin	100g	200	500	15
Pencycuron 22.9% SC	Monceren	150-187.50g	600-750	500	69

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CRRRI Technology Bulletin 279

Published by: ICAR- Central Rice Research Institute, Cuttack, Odisha 753006



Typesetting: ICAR-National Rice Research Institute, Cuttack-753006, Odisha
Published by: The Director, ICAR-National Rice Research Institute, Cuttack (Odisha) 753006
Printed at: Printtech Offset (P) Ltd., Bhubaneswar



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